Capstone Industry Council Meeting

July 12, 2006

Agenda

- **0800-0945 Information Sharing**

– Opening	Sue Gardner
– Technical Status Update	Mark Olson
– Operations Status Update	Ray Collins
– FAA JRC Planning Status Update	Sue Gardner
– Conoco Phillips Capstone Planning	Dennis Parrish
– WAAS Update	JoAnn Ford
– Alternatives for Retaining Transcribed Weather Broadcast Services in Alaska	Mike Borowski

- **0945-1000 Industry Feedback (Roundtable)**

Opening:

- Status of ADS-B Services
  - June 15th
    - Resume ATC separation and advisory services using ADS-B
    - Three GBTs – Bethel, Aniak, and St. Mary's
  - July 15th
    - FAA to begin an operational validation of minimum separation standards between an ADS-B target and a radar target
    - Three GBTs – Bethel, Aniak, and St. Mary's
  - August 15th
    - FAA to expand operational validation
    - Five GBTs – Bethel, Aniak, St. Mary's, Dillingham and King Salmon

Opening (continued)

- Highlights from FAA Administrator Visit in July
- Highlights from Senate Field Hearing
- Personnel Changes
  - Pat Poe is retiring in August
  - New Capstone Staff
    - John Harrington — Operations Project Manager
    - Walter Combs — Technical Project Manager
- Transition Working Group meeting today at 1:30 PM
- FAA Executive Briefing on Capstone Phase III this Friday

Pictures from Rick Day (ATO-E) Visit

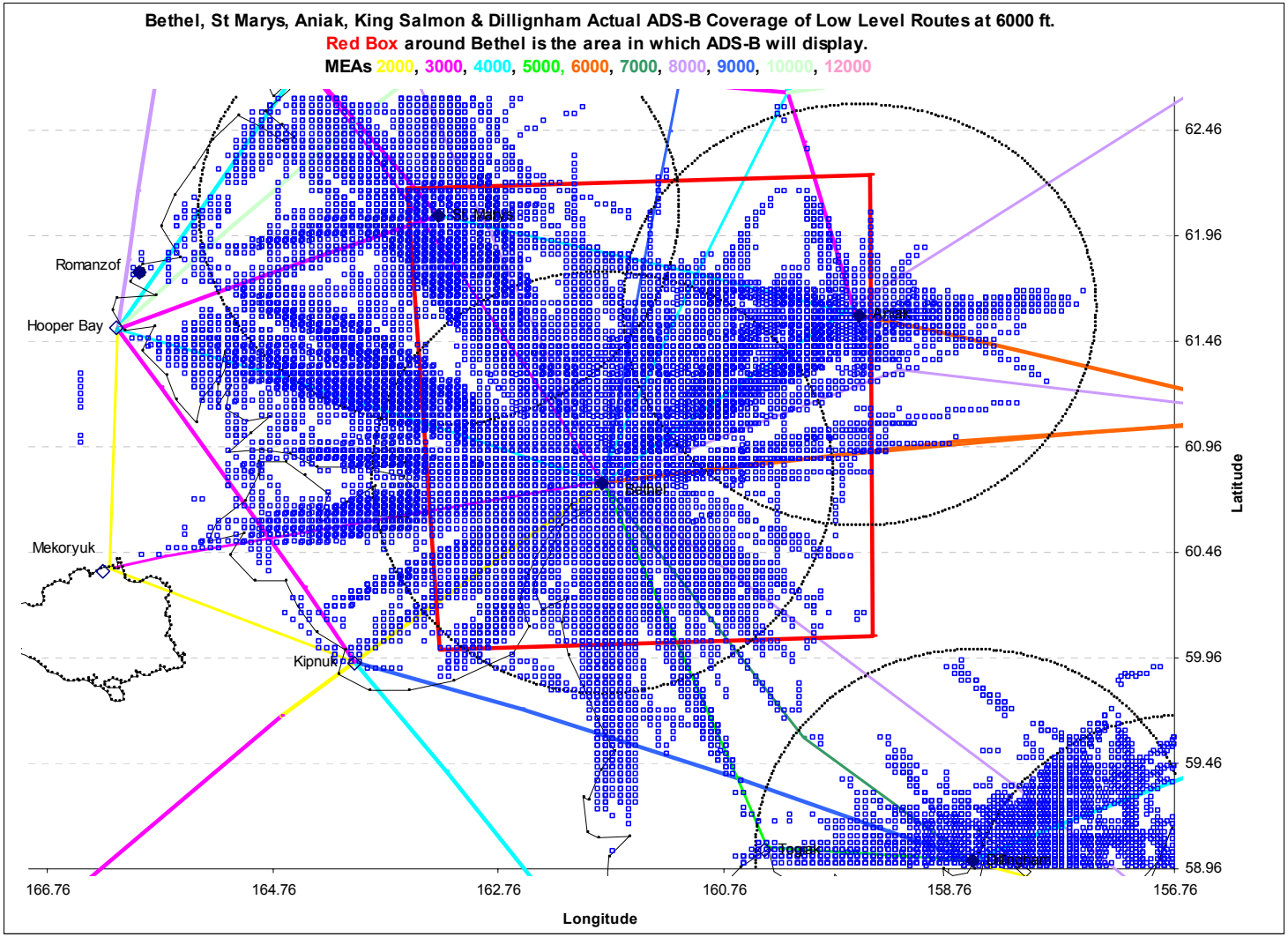
Technical Status Update

Mark Olson

Recent Events

- FIS-B is broadcasting data from 120+ Alaskan reporting stations as of 7 Jul 06
- If there are any anomalies noticed, please report immediately to Flight Service (AFSS)

Phase I Coverage Box



STATUS OF SERVICES ON JULY 12 – Y-K

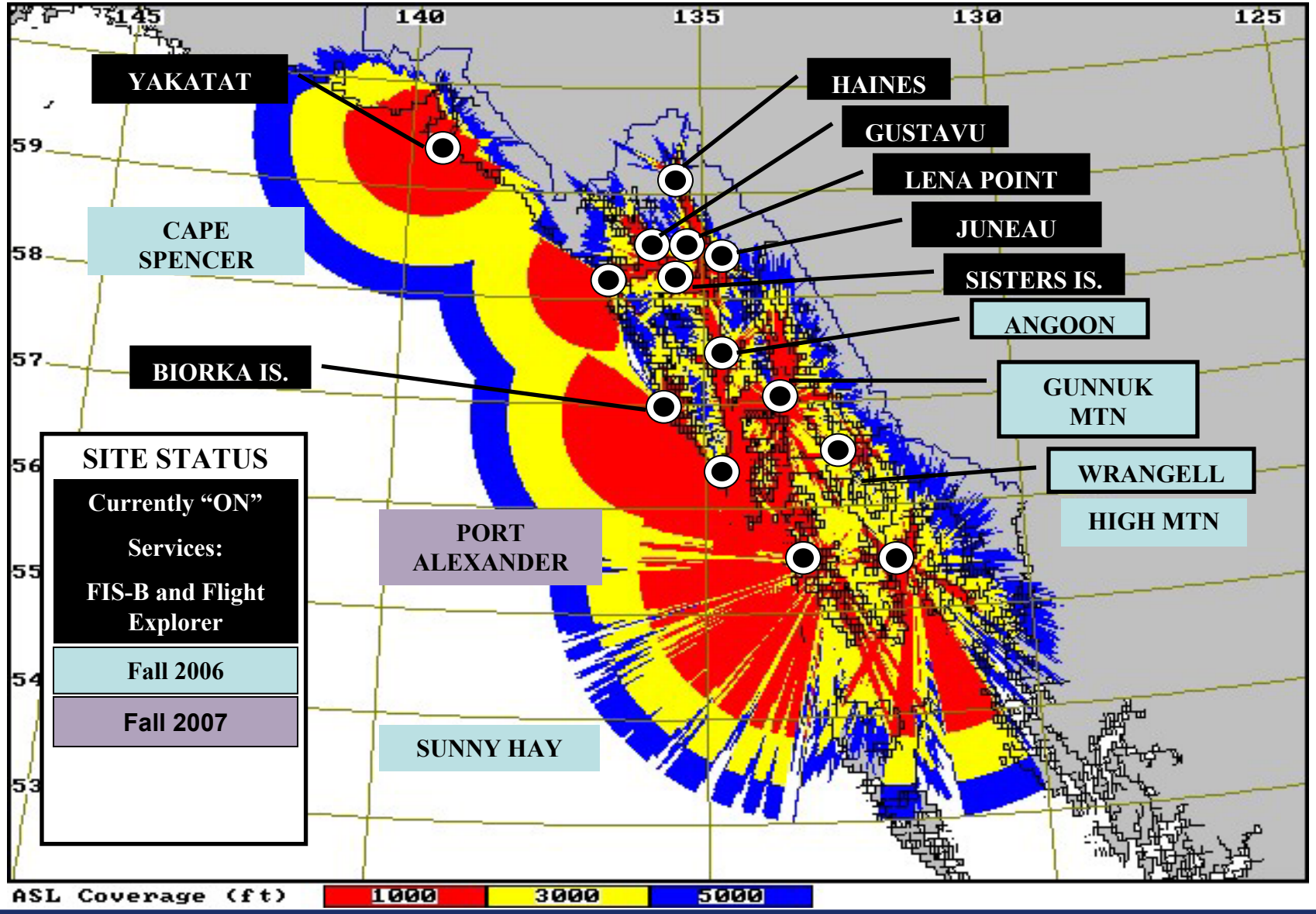
	ADS-B Surveillance	FIS-B	TIS-B	CRABS	VOLPE / Flight Explorer
Phase I: Y-K Delta					
Bethel	X	X	N/A	X	X
Aniak	X	X	N/A	N/A	X
St. Mary's	X	X	N/A	N/A	X
Dillingham	% O/S til 8/15	X	N/A	N/A	X
King Salmon	% O/S til 8/15	X	N/A	N/A	X
Unalakleet	# TBD	X	N/A	N/A	X
Sparrevohn	# TBD	X	N/A	N/A	X
Tatalina	# TBD	X	N/A	N/A	X
Cape Romanzof	# TBD	X	N/A	N/A	X
Cape Newenham	# TBD	$ O/S	N/A	$ O/S	$ O/S
Site Summit	# TBD	X	X	X	N/A

X = Available **N/A** = Not Available **# TBD** = Current date is unknown - awaiting ATO-E decision

% O/S = Out of Service.

. **$ O/S** = Out of Service. Cape Newenham - wind damage to satellite communications facility.

PHASE II GBT SITES



STATUS OF SERVICES

	ADS-B Surveillance	FIS-B	TIS-B	CRABS	VOLPE / Flight Explorer
Phase II: Southeast					
Juneau	# TBD	X	N/A	N/A	X
Yakutat	# TBD	X	N/A	N/A	X
Sisters Island	# TBD	X	N/A	N/A	X
Gustavus	# TBD	X	N/A	N/A	X
Lena Point	# TBD	X	N/A	N/A	X
Biorka	# TBD	X	N/A	N/A	X
Gunnuk	# TBD	X	N/A	X	Fall '06
Wrangel	# TBD	X	N/A	X	Fall '06
Angoon	# TBD	X	N/A	X	Fall '06
Haines	# TBD	X	N/A	N/A	X
Sunny Hay	# TBD	Fall '06	N/A	N/A	Fall '06
Cape Spencer	# TBD	Fall '06	N/A	N/A	Fall '06
High Mountain	# TBD	Fall '06	N/A	N/A	Fall '06
Port Alexander	# TBD	Fall '07	N/A	N/A	Fall '07

X = Available N/A = Not Available # TBD = Current date is unknown - awaiting ATO-E decision

Operations Status Update

Ray Collins

Chelton 6.0B Software Upgrade

Status: 7/6/06

- IDU Memory Upgrades – 12 remaining, all in coordination
- Software 6.0 Certification
  - Chelton advises 1st Quarter CY 07

Capstone SE Installations

Status as of July 6, 2006

Chelton:	2 In progress	0 Remaining
Garmin F/W:	0 In progress	0 Remaining
Garmin Hel:	0 In progress	0 Remaining
GDL90 Ret:	0 In progress	0 Remaining
GDL-IDU :	0 In progress	0 Remaining

Helos: 9 carry-over – on interim contract
(1 Coastal, 8 Temsco)

ITEMS of INTEREST

SE AK Flight Explorer – Training in Progress

Juneau ATCT

HeliPro Contract – Maintenance & Installs

Avionics Request for Information (RFI)

FAA JRC Planning Status

Sue Gardner

FAA JRC Planning Status Update

Final Investment Decision JRC Date: August 24, 2006

Executive Council

- Briefing EC on July 14, 2006 on Statewide Implementation Strategy

Planning Status

- Cost Analysis is in coordination with ATO-F
- Working to put together risk adjusted cost & schedule information for the JRC documentation

Conoco Phillips Capstone Planning

Dennis Parrish

WAAS Update

JoAnn Ford

Alternatives for Retaining Transcribed Weather Broadcast Services in Alaska After Non-Directional Beacon Divestment

Mike Borowski

June 14 2006

Need to Transition to a New Navigation Infrastructure in Alaska

- A combination of Capstone (GBT and avionics) deployment, and satellite navigation, is enabling a reduction in dependence on ground-based navigation systems across the NAS
  - Better navigation accuracy and availability with the new technology
  - Significant reduction in the cost of operating, maintaining and replacing ground-based systems in a time of very tight FAA budgets

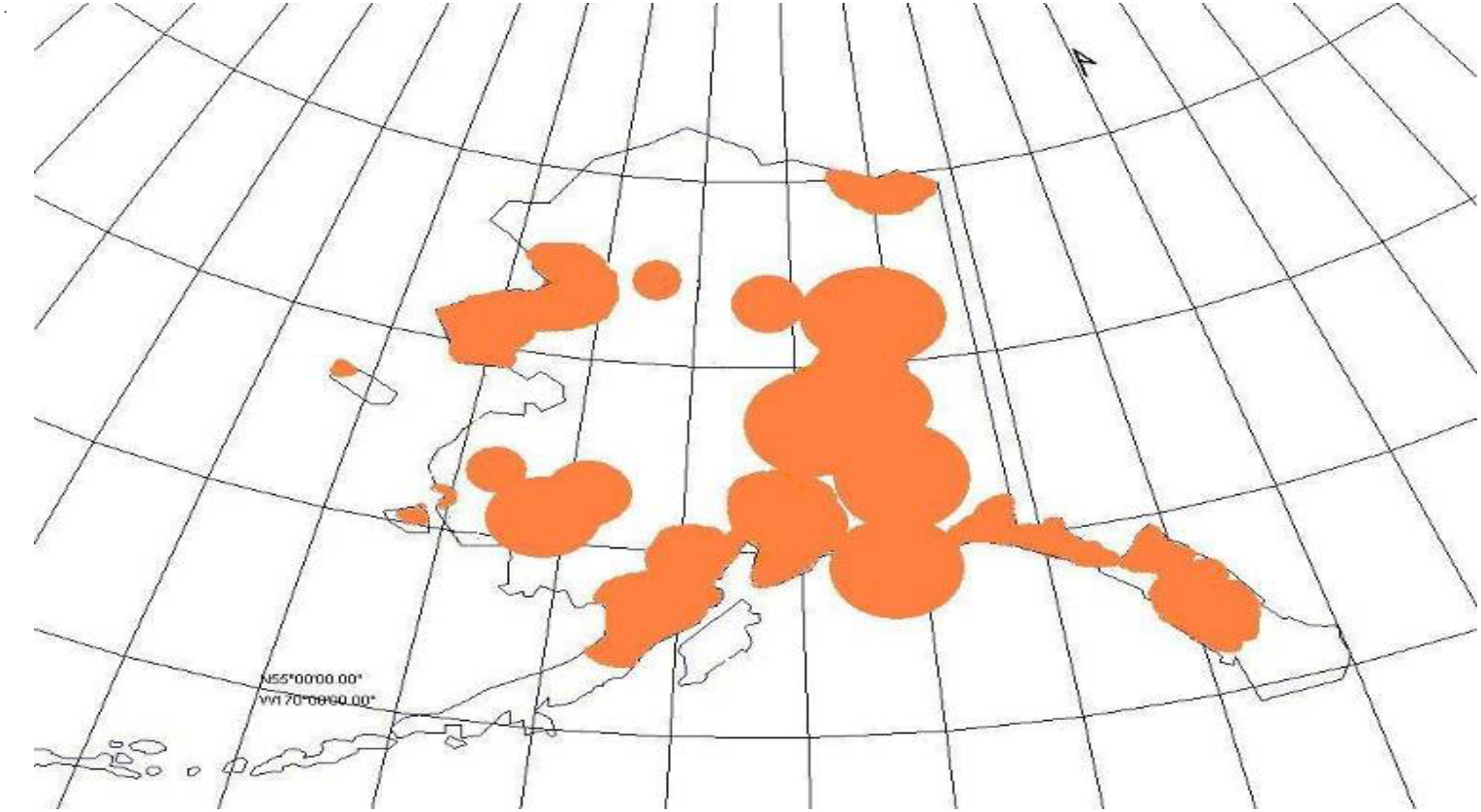
TWEB Service in Alaska

- Primarily delivered over the audio channel on Non-Directional Beacons (NDBs), and a few VORs
- Often the only en route forecasts available for routes between remote villages
- Alaska pilots and operators have stated a need to receive TWEB information prior to departure (i.e., aircraft on the ground)
- Propagation characteristics of the LF band where NDBs operate often make reception on the ground possible over distances of hundreds of miles from the stations

Need to Maintain TWEB Service

- TWEB services should not be removed until/unless alternative coverage is available
- The TWEB function now provided via NDB in Alaska cannot be replaced, with the same degree of coverage for aircraft on the ground, using any FAA infrastructure available under Capstone. Development of a TWEB alternative would require substantial systems engineering investment.
- Net cost savings from TWEB divestment would be $4.8M, reduced further by the cost of an alternative
- Recommendation: Do not propose TWEB divestment in the pending Capstone Statewide Baseline

Current Alaskan NDB Coverage *for Aircraft on the Ground*



Alternative Communications Outlets for TWEB Delivery in Alaska

- The following alternatives were evaluated for their ability to replace NDB-based TWEB services:
  - Satellite (Voice) Telephone
  - Satellite Data Communications
  - Satellite Broadcast Radio
  - Commercial (in cockpit) Weather Providers
  - Cellular Telephone
  - FAA Air/Ground and FSS Communications Systems
  - Audio Channel on VORs
  - Capstone GBT Network
  - AM Broadcasting Stations

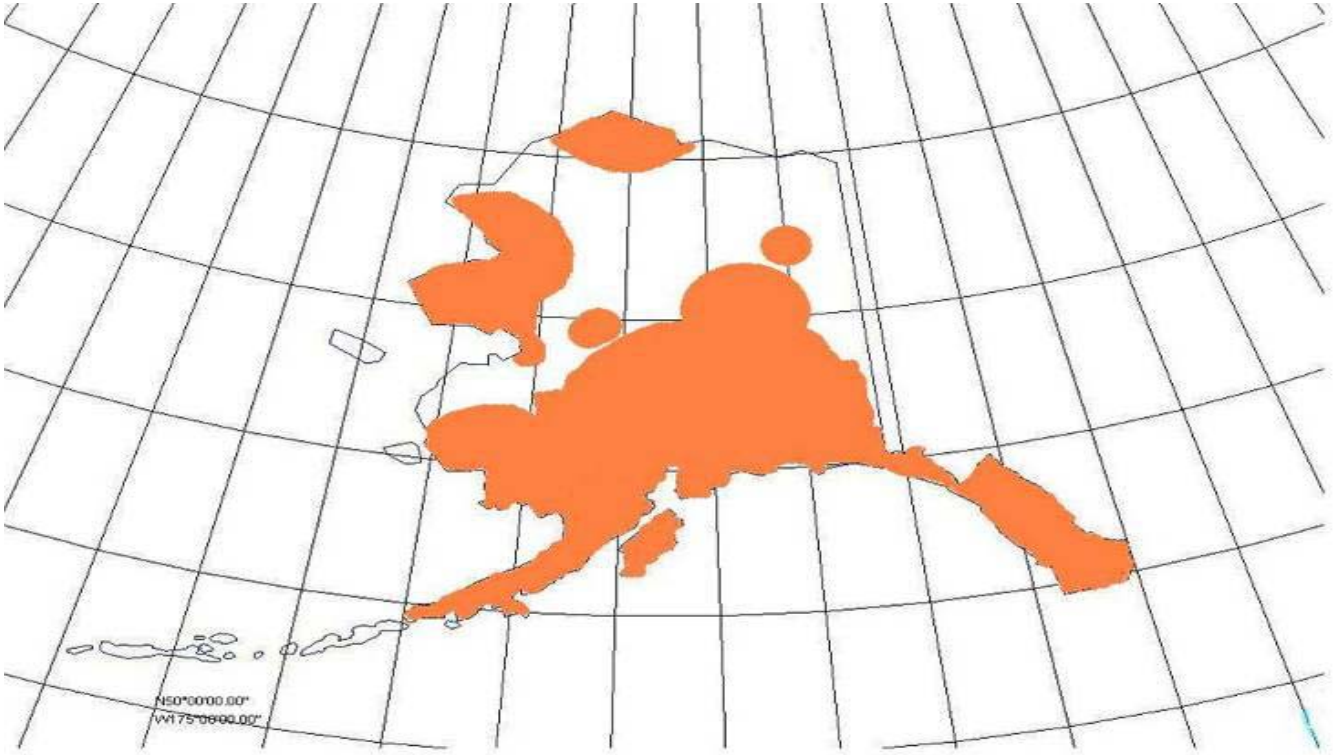
Results

- For all non-FAA communications outlets, connectivity to the TWEB data source(s) will have to be provided
- There is only one provider for satellite voice telephone (Iridium); cost may be an issue
- Satellite data services are in a state of flux and no avionics are available or planned
- Satellite Broadcast Radio coverage is (for all practical purposes) not available in Alaska
- The coverage area for commercial in-cockpit data providers lacks continuity in the areas of Alaska where TWEB is most needed
- Cellular telephone coverage is better than might be expected, given Alaska's population density, but can't do the job alone
- The *surface* coverage of FAA communications/navigation systems (A/G, FSS or GBT - comm; VOR - nav) is not adequate, by itself

Results (continued)

- The surface coverage of AM Broadcasting stations in Alaska is better than for the current NDB network; it is the only option that provides equivalent surface-coverage service
  - ADF receivers can tune over the AM broadcast band, so avionics is not an issue
  - Like all non-FAA networks, however, a means will have to be found to get the TWEB data to the AM stations – ANICS is likely the best method
  - Agreement must be reached with broadcasters to allot time
- The coverage that is available from FAA systems, and from satellite and cellular telephone should be included in a composite solution, where the combination of coverage and need is cost-effective
  - Cellular telephones will require a special waiver from both FAA and FCC for use while airborne, even at low altitude; should not be an issue in Alaska, but has to be dealt with
  - Telephone numbers need to be set up for TWEB like they are for ASOS/AWOS/ATIS

Results (concluded)
AM Broadcasting Station Coverage on the Surface in Alaska



Potential Future Roadmap for TWEB Replacement (If and when a decision is made to divest TWEB)

- Develop telephone numbers for the TWEB services similar to AWOS, ASOS and ATIS
- Take action on the special waiver from both FAA and FCC for use of cell phones to obtain TWEB services while airborne
- *Confirm* requirement for TWEB on the surface with Alaska pilots and operators
  - Recommend getting a *written* "resolution" from appropriate group(s) (Industry Council, Capstone Coalition, etc.)

Potential Future Roadmap for TWEB Replacement (continued)

- Make decision regarding which communications outlet(s) will be implemented and on what schedule
  - Define decision metrics (coverage, cost/benefit, etc.)
  - Coordinate implementation schedule with NDB divestment plan
  - Analyze budget issues; get budget wedge defined
  - Coordinate with user community

Potential Future Roadmap for TWEB Replacement (concluded)

- Then, for each selected communications outlet:
  - Meet with appropriate company officials (cellphone, broadcaster, etc.) to verify their ability/commitment to support TWEB on their system
  - Refine coverage map and format it for ease of use
  - Determine method for connection to TWEB data source, and costs for doing so
  - Determine other costs, including both initial setup and O&M
    - FAA AF involvement?
  - Develop procedures for publishing access to TWEB information (frequencies, times, phone numbers, etc.), including the creation of appropriate entries/charts in the Alaska Supplement A/FD

Backup/Detail Slides

Summary of Findings (1)

Table 1. TWEB Data Sources and Technical Issues

Candidate Source of TWEB Broadcasts	Connected to TWEB Data Source at FAA?	Area Coverage Rating (1=Best, 10=Worst)	Avionics Available ?	Relative Cost of *Service* (1=Lowest, 10=Highest)	Remarks
Satellite (Voice) Telephone	**No**	**1**	**Note 1**	**3**	**Only one vendor**
Satellite Data Service	**No**	**1**	**Note 2**	**Unknown**	**Costs varying widely as competition sorts out**
Satellite Broadcast Radio	**No**	**Note 3**	**Note 4**	**N/A**	***Unavailable* in Alaska**
Commercial Weather Providers (In Cockpit)	**No**	**Note 5**	**Yes**	**3**	**Wide variation in area coverage and required avionics**
Cellular Telephone	**No**	**3**	**Note 6**	**2**	**May need approval to operate at low altitudes after departure**

Summary of Findings (2)

Table 1. TWEB Data Sources and Technical Issues

Candidate Source of TWEB Broadcasts	Connected to TWEB Data Source at FAA?	Area Coverage Rating (1=Best, 10=Worst)	Avionics Available ?	Relative Cost of *Service* (1=Lowest, 10=Highest)	Remarks
FAA VHF Communications (ATC/FSS)	**Yes**	**8**	**Yes**	**1**	**Good coverage only at airports where RCO or RCAG is present**
VOR Audio Channel	**Yes**	**8**	**Yes**	**1**	**Good coverage only at locations near a VOR**
GBT Network	**Yes**	**5**	**Yes**	**1**	**Need to be Capstone equipped, or at least have a GDL-90**
AM Broadcast Stations	**No**	**1**	**Yes**	**1**	**Lowest cost, best coverage single-source alternative**

Summary of Findings (3) [Notes to Table 1]

Note 1. Handsets are already used in aircraft in Alaska, but are not "avionics," per se

Note 2. No known generally available avionics, but AirCell does provide data services to Corporate Aviation, although it is a *terrestrial* system that uses cellular technology

Note 3. Very limited and unpredictable coverage in Alaska

Note 4. Receivers for use in cars exist and could be used in aircraft in the Lower 48, perhaps with some special approvals

Note 5. Coverage area varies widely among providers

Note 6. Special authority will likely be needed from both FAA and FCC to permit use of cellular phones except where the aircraft is on the ground

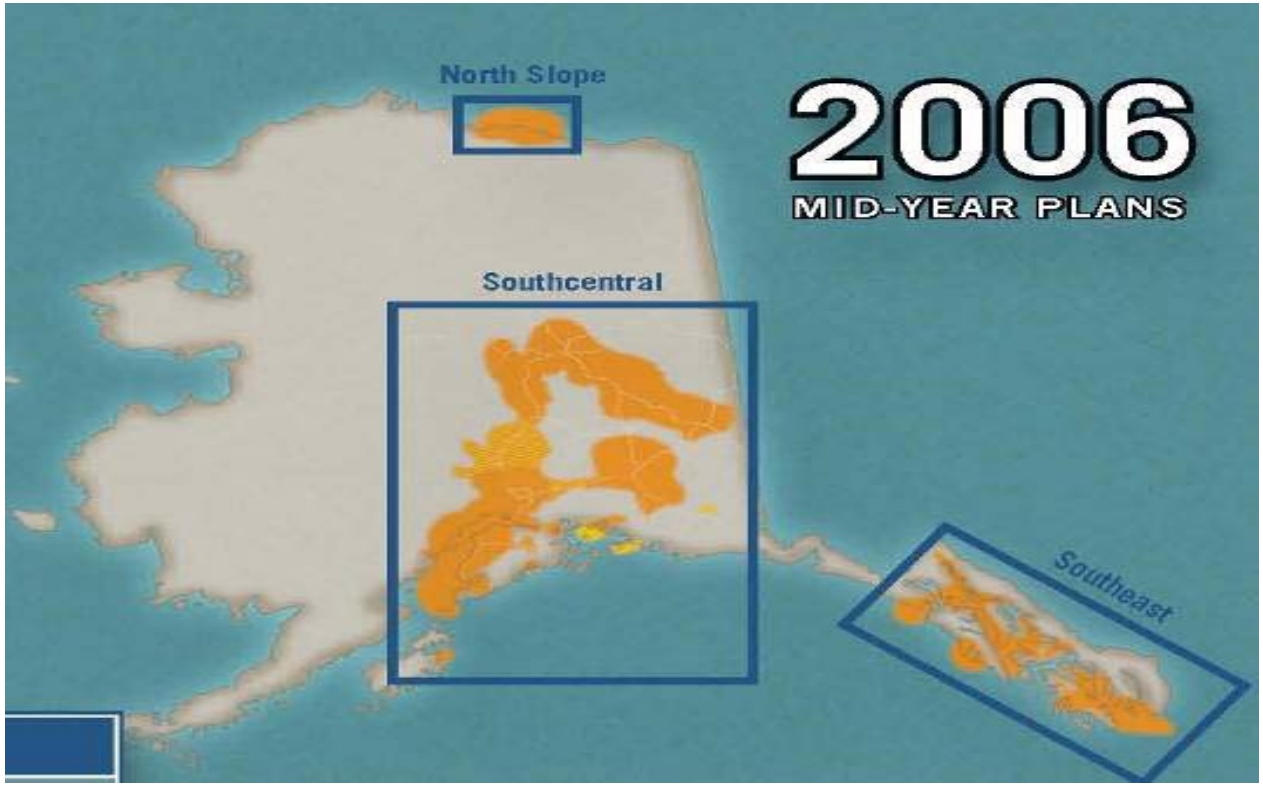
Notes on AM Station Participation

- The FAA Rules (CFR 47, Part 73) contain *requirements* for broadcasters to participate in "public service" information dissemination activities as a condition of their license
- Although the FCC's enforcement of these provisions has weakened over the years, it is still a carrot to use with the AM station owners
  - Additional benefit to them is that they can "advertise" that they are the TWEB source for their area, which will doubtless increase their audience

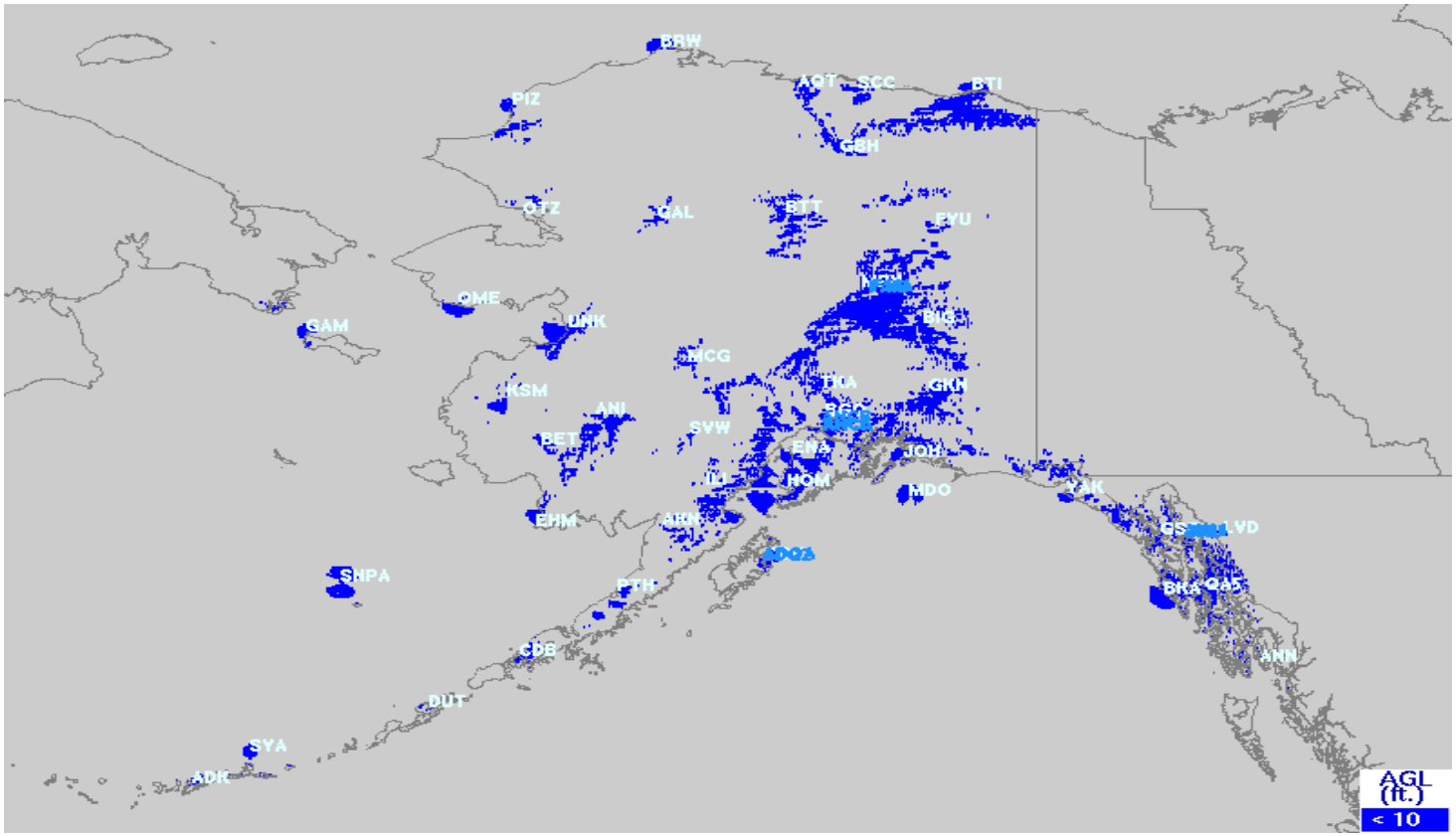
Evaluation of FM Broadcasting Stations

- FM Broadcasting stations are prevalent in Alaska
  - But those in remote areas are “low power” stations
  - No avionics are available
  - Use of *portable* FM receivers in aircraft is prohibited by FAA because of danger of interference with on-board navigation systems (VOR and ILS/LOC)
  - Not considered a viable alternative

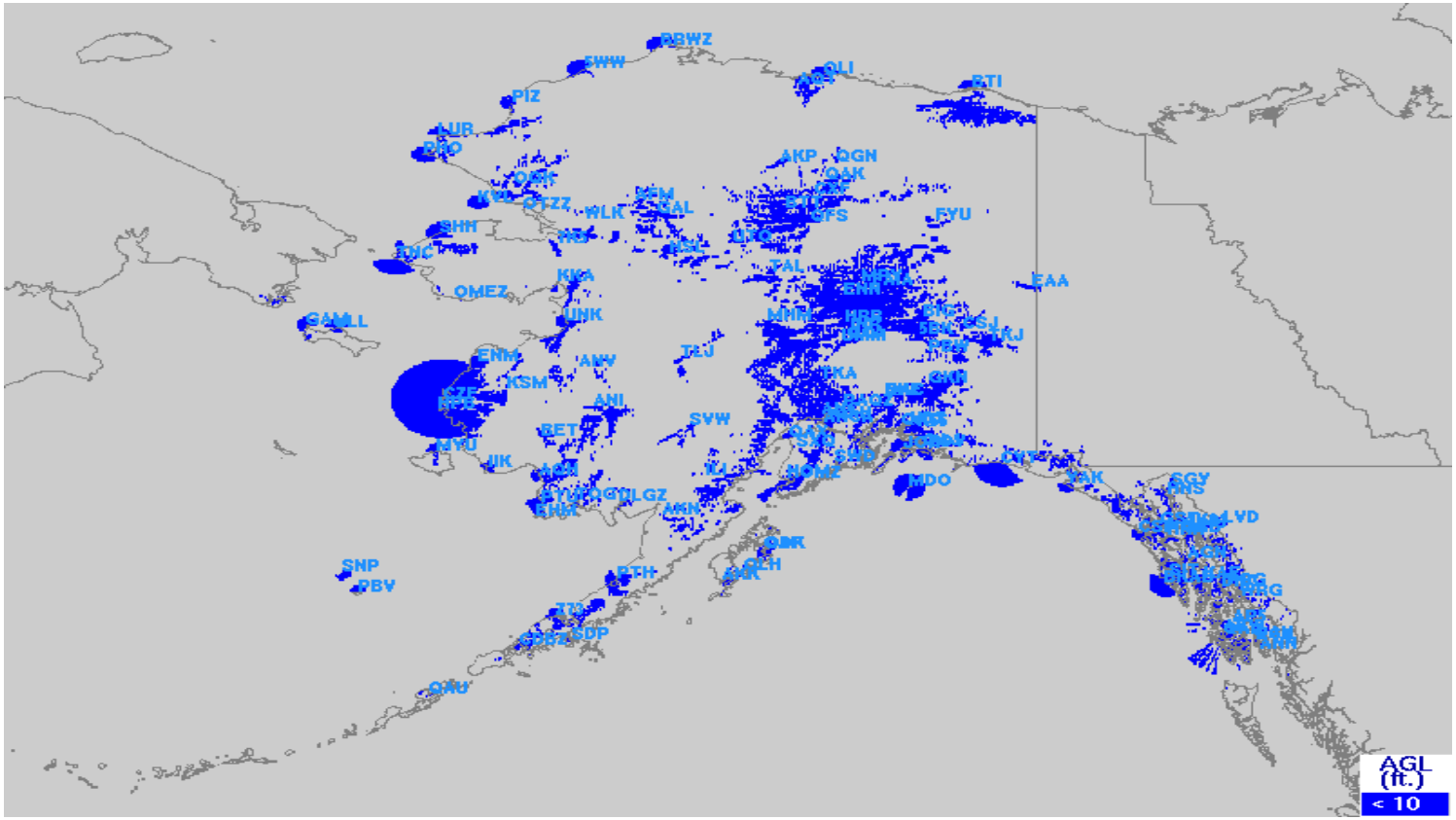
Backup – Cellular (ACS) Coverage



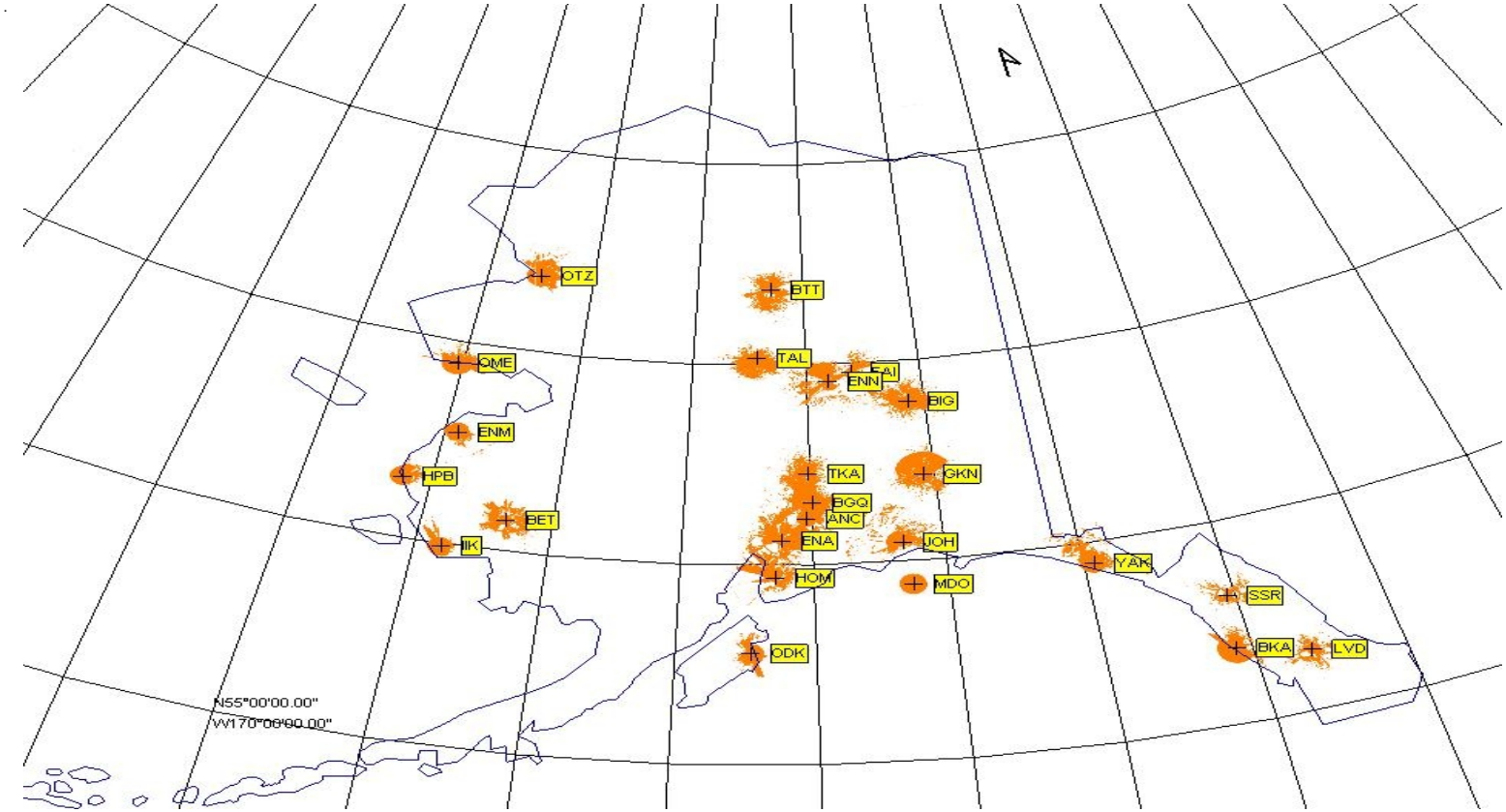
Backup: FAA RCAG Coverage on the Surface



Backup: FAA FSS RCO Coverage on the Surface



Backup: FAA VOR Coverage on the Surface



Backup: FAA/Capstone GBT Coverage on the Surface